

# SOIL REMINERALIZATION

## A Network Newsletter

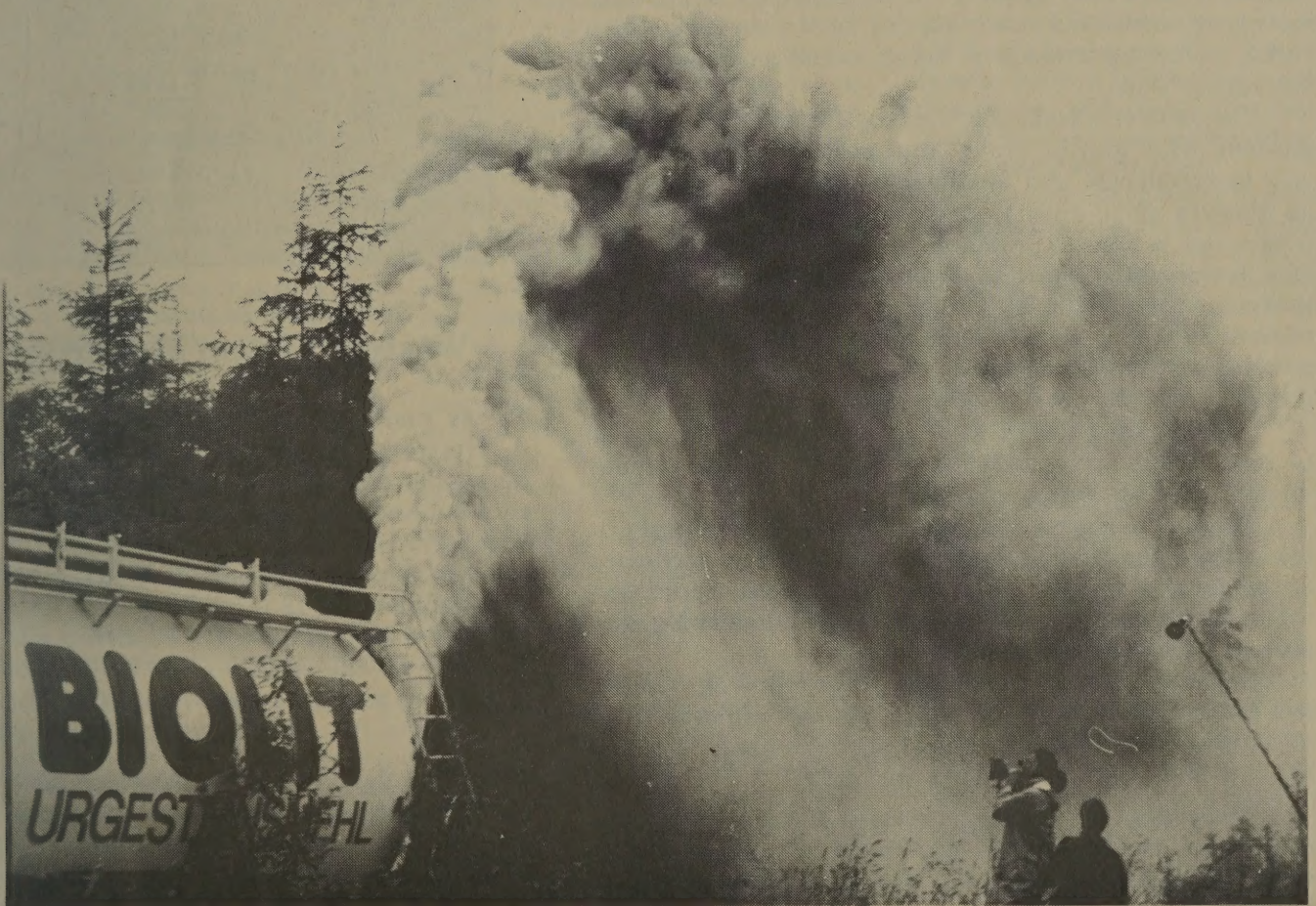
SAMPLE DO NOT TAKE

Volume II, Number 7

Fall, 1987

*"Doing a pot test is the most convincing argument I know of. Anybody can do it. There are testing laboratory grinders everywhere. There is no lag time. In 6 hours you can get a microorganism population explosion. Taking some 6" clay pots, I filled them with a 50-50 mixture of earth and peat and 3 heaped tablespoons of dust. The results were astonishing!"*

John Hamaker



This may be a complimentary copy. If you wish to join *Soil Remineralization, A Network Newsletter*, please send \$12.00 (within the U.S.), \$15.00 (outside the U.S.) for one year (4 issues) to SOIL REMINERALIZATION, Joanna Campe, 152 South Street, Northampton, MA 01060.



# Soil Remineralization

## A Network Newsletter

The newsletter is a reflection, forum, round table of ideas, experiences and research of those concerned with networking and implementing soil remineralization. Articles, letters, and photos are welcome and appreciated. It reaches an emerging grass roots community network around the world.

### Eden or Ice Age- Which Will We Choose?

The book *The Survival of Civilization* by John Hamaker and Don Weaver is regarded by a growing movement worldwide as a blueprint for the survival of the earth, restoring ecological balance and perhaps, even recreating Eden.

The remineralization of forests, farms, orchards and gardens with glacial gravel and rock dust, is nature's way to regenerate and fertilize soils. During an ice age, as glaciers grind rock to a fine dust over millennia, a fertile soil is created. Adding finely ground gravel dust is a tremendous boost to organic agriculture and can make it truly viable by adding up to a hundred trace minerals and elements needed by all life and by nourishing the microorganisms in the soil, whose protoplasm is the basis of all living things.

Undertaking the task of remineralization is urgent to restore our agricultural soils and to save the dying forests in the temperate latitudes.

There is evidence to suggest that as forests begin to die off worldwide, giving off carbon dioxide, the climate of the earth is altered, triggering the transition from the warm interglacial - to an ice age. We are hastening this process with the burning of fossil fuels.

In our age of high technology, we are finding we have lost touch with nature. The consequences could be truly disastrous. Can we heed nature's warnings and choose to take the path to becoming earth stewards?

The ultimate poverty is poverty of the soil. Soil is the very basis, the foundation on which true abundance is created. Remineralizing our forests and soils is an extraordinarily beautiful way to restore ecological balance. We must act to prevent the destruction of the rainforests, stop desertification and halt the dying of temperate forests. Our future survival and the fate of the earth hangs in the balance.

Joanna Campe

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### Sent to SR on December 9: Western Union Mailgram

Please mail copy of 'Soil Remineralization: A Network Newsletter' to the address hereunder as Petra Kelly is very interested in this subject thanking you in advance and best regards

Ingrid Aquane Office Petra K. Kelly Mdb  
Bundeshaus HT 718 D-5300 Bonn.

Petra Kelly is author of *Fighting For Hope*, a founder of the Green Party and a member of Parliament in Bonn, Germany.

Order *The Survival of Civilization* (\$12) and *The Solar or Ice Age? Bulletin* (\$6 donation) from Hamaker-Weaver Publishers, P.O. Box 1961, Burlingame, CA 94010

### On the Cover:

Filming of the documentary *Stopping The Coming Ice Age*. Remineralization of a forest in Tirol in the Austrian Alps with Biolit rock dust from the Sanvita Co. near Kitzbühl, Austria in June, 1987. See story on page 8.



# Buying Gravel Dust

by John Hamaker

A grower of crops or a gardener needs a good response the first year after a fall application. The response in any one year depends on the amount of minerals available to the microorganisms, soil moisture, and the amount of inert organic matter.

If the last two factors are satisfactory as little as 3 tons of gravel dust per acre worked into the top 4 inches of soil should give good results. However I prefer about 10 tons per acre worked in about 8 inches since one application will eliminate the cost of a number of more frequent applications and give high yields.

As I use the term gravel dust I mean dust 90% of which will pass through a 200 mesh screen. Obviously if only 5% will pass the screen you would need a great deal more to give satisfactory results. There is a vast difference in surface area between dust and fine sands. As demand grows and more and more people offer dust for sale the "dusts" will vary widely in quality and fineness of grind. I recommend a couple of tests before buying. A pot test will tell you if the dust will increase microorganisms as reflected in plant growth. You can make a test of fineness of grind. Fill a clear glass container about half full of dust and cover with about 2 inches of

water. Shake it vigorously and let it settle overnight. You can measure the fractions and get fairly accurate percentages. If the container is allowed to stand until the water has dried out, the dust layer will shrink to about 1/3 the original measurement and give a more accurate percentage of dust. Your first observation, however will tell you if you are buying mostly sand. If the sands have gone through a grinder they will be activated and give longer life to the soil; but the cost of transportation of the large quantities required to give satisfactory yield will generally be prohibitive.

There is one other test that relates to buying dust: A sample from the stockpile can be weighed, dried in an oven and weighed again. That way you can know how much is water and how much is dust. I suspect that the water content of dust in open storage can vary widely. If the material is bought by the yard there is a probable increase in bulk when wet. As the industry expands they will probably sell in dry weight and adjust for the moisture. But for now I expect dust will be sold "as is", take it or leave it. However, it doesn't hurt to ask about moisture content so the sellers can begin thinking about standardizing sales practice. The buyer needs to test so he can know the actual weight of dust he is applying to the land.

A glance at the table of particle sizes and surface areas on page 21 (TSOC) makes it obvious that only the water suspendable clay-size particles, the dust, will do you any good in economical quantities. The minimum practical screen, 200 mesh, includes silt and about half the very fine sand and you can not buy by screen test alone. You may be getting only silt and sand with no dust. So you must know the percent of water-suspendable material so you can calculate how many tons of a given ground product you must buy to get the number of tons of dust per acre you have decided to apply.

Several people have reported to me that gravel dust does not work or that it will have a temporary effect. They don't describe the dust in detail but I suspect they had very little dust in what they call dust. Know what you are buying or you may be badly disappointed.

One other thing might be useful. I put about 2 inches of sand on our garden before plowing. It will last a long time and give some yield after the dust is used up. I am sure it has been contributing to what we grow. Unscreened sand (preferably fine sand) from a local gravel pit is much more economical than shipping dust which is mostly silt and fine sand.



## Hugh Lovel... on Remineralization

I had a neighbor who asked me once where he could get some granite dust, as he had heard it was a good organic fertilizer. Off the top of my head, I suggested he go see the gravel pit. He did, and found that in the gravel making process dust collected around the bottoms of all their shakers and under their belts. This was too fine to be of much use for sale and was pushed off the mountain at the gravel pit as waste. They let him have all he would haul away free just for getting it out of their

way. He had a spectacular garden that year, and I asked him about it. What had he done? It turned out he had put 1/2 inch of [gravel] dust all over everything and tilled it in.

I then had to try it too. My experiments were really surprising. The sweetest corn, the most luxurious soybeans, the best green peas ever, etc. I had it analyzed. It turned out to contain, by analysis and available form, about \$25 worth of phosphorus and about \$12 worth of potassium, compared to the commercial salt fertilizers. Moreover, it contained nearly 16 times as much potassium in unavailable form, and abundant calcium, magnesium, sulfur, and calcium, and every trace element tested for. It may have cost me about \$4

per ton to haul and spread. By now I have gotten the gravel quarry folks to stockpile it rather than wasting it, and they load trucks for \$3 per ton.

My discovery about using ordinary ground stone as fertilizer is something any farmer or small group of farmers can do. Industries have no chance of cornering the market of producing these things and monopolizing it all. Any farmer can incorporate the metallic and silicious materials of pulverized stones into his soil...

From *Advanced Sciences Advisory*, July, 1987, sent to SR by Glenn Wiprud  
Excerpt printed with permission from the author, Hugh Lovel, Union Agricultural Institute, Blairsville, GA.



# John Hamaker responds to often asked questions...

Mineral Analysis?  
Pot Tests?  
How Much?  
What Costs?

Two letters received by S R recently from Toronto and London deal with the same question from entirely different perspectives. One wants "short sharp answers" to the questions "experts" ask and one as an expert, asks some questions.

The first poses some questions asked by experts:

1)...we don't know that this (remineralization) works..." This is a surprising question since the mixed rocks of the earth's crust have been food for the soil organisms for at least 3 1/2 billion years.

During the very long periods when there has been enough CO<sub>2</sub> and related "greenhouse" gasses to produce enough warm clouds to fall as rain in the upper latitudes and wash away the ice, growth of every form of life has been vigorous and the size of grazing animals has ranged up to 40 tons. Now the only animals who weigh that much are whales. They feed at both poles where the huge quantities of dust ground by glaciers results in a life support system sufficient for whales. The coal forest of the carboniferous age could not possibly have captured the huge amount of CO<sub>2</sub> required to produce those forests if there had not been an abundant supply of minerals.

The simple fact is that the CO<sub>2</sub> and other greenhouse gases and the minerals (and because of the gases, heavy rains fell in middle and upper latitudes) were all supplied by catastrophic explosive events. The separation of the Americas from Europe and Africa 225 (+ or -) million years ago set off sporadic explosions lasting 100 (+ or -) million years. The dinosaurs developed during that period and died out as the explosions died out and the quantity of CO<sub>2</sub> and rock dust decreased.

When catastrophic events begin, as in the case of Tambora, life within range of the lethal effects of shock waves and toxic gases is stamped out, but the primary effect is to fill the world's atmosphere with dust and gases sufficient to blot out the sun producing extremely cold winters and summers, resulting in famine for the latitudes affected. Continuation of the explosions sets in motion a glacial epoch lasting until the heating effect of the greenhouse gases dominates over glacial buildup. At the end of a catastrophic event the CO<sub>2</sub> is decreased to the point where glaciation sets in. The major extinctions occur as the abundance of factors which support life are decreased to a much lower availability and a climate change that is variable instead of continuous. If the diseases of malnutrition did not kill all the dinosaurs, the glacial winters would certainly finish the job.

Glaciation covers as much as 1/3 of the land surface. Sand and gravel remineralize the 1/3 and the lowland outwash plains. The rest of the earth depends upon wind-born dust for remineralization. When the land is worn out, there is a long period of time when a large part of the world can support very little life of any kind. For that reason the survivors of 90,000 years of glaciation are the few who find refuge generally in mountainous areas where the minerals of erosion join the sea solids brought down by the rain to mountain life.

Among the scientists there are two schools of thought. One thinks that extinctions are the result of asteroid impacts. The other thinks extinctions are the result of catastrophic volcanic explosions. Neither is correct. There are physical scientists who know nothing about how nature supports the life system and the all important role of the dust of the mixed rocks necessary in the food supply for microorganisms at the base of the chain of life.

What happened to the dinosaurs is now happening to all the living organisms. As the soil runs out of minerals the soil organisms have died out to the point where they occupy only the top few inches of soil. When the basis of the chain of life dies out, all other life must die out. The diseases of malnutrition and or famine are taking a heavy toll of all species. People are dying by the millions. The changing of the climate is putting a heavy stress on crop production at an increasing rate. No matter what the birth-rate, the death rate will soon exceed it.

## On local sources of gravel dust

The experts also ask or are they telling as experts, "... the gravel needs to be special gravel." The experts are graduates of agricultural schools controlled by the agricultural chemicals industry. They teach disinformation. Any figures they have on what a soil or plants should have were acquired in the last few decades of 150 years of declining soil fertility. They don't know anything about what soils or plants should have to support a vigorous life system. NP and K have been overemphasized because all research has been directed to increasing yield per acre with total disregard for food quality. The Kervran research on biological transmutation is not a part of their thinking. Neither is the fact that the microorganisms select what when need to make the compounds of life and reject to the subsoil what is not needed, aluminum, silicon, and iron, etc., which are generally in excess. As long as the soil is neutral or close to it microorganisms control what goes into the plant roots. The controls are off when the soil is acid or acidic chemicals are added. Whatever the acid will dissolve will show up in the ground water after as rain and dry plants will drink it up.

The locally available gravel may need additional agricultural limestone if there is not enough to bring the acidic soil up to neutral. Soil PH should be taken annually to find out if dolomitic limestone is required.

If areas 1500 plus miles from the ocean do not get enough sea solids, they should be added with the gravel dust.

Gravels which are found close to an area where heavy metals are mined or might contain other toxic contaminants should be held suspect until it can be shown that they do not come through to plant life.

The above are the only three conditions I would put on the general rule of using what is locally available.

One more statement heard from experts: "... the crushing [grinding] process will be so expensive that it won't be a financially viable operation."

That is just a propaganda statement. I could restate as follows; "It costs too much to save our lives so we will continue to use chemical agriculture until we die of starvation a few years  
can't page 5



## An Update on Superbiomin

### *After Chernobyl the Russians picked up 2000 kilos of Superbiomin in a military truck*

The Spring 1986 issue of *SR* ran two articles, *Dying Forest comes back to life* and *A Fortuitous Accident*, an editorial in *American Laboratory* magazine written by editor Frederick C. Scott, Jr. The following are a few excerpts written a letter to Mr. Scott:

"I discovered the phenomenon of gravel dust by accident. While building a 1.5 mile long road through my forest property in Grimsing near Melk, Austria, in July 1981, a lot of dust developed from the ground being worked on. In

areas where the gravel dust caused by gravel transportation settled, within a few months all sick fir trees got healthy again and have grown very strongly since....

I, myself eat 2 teaspoons of gravel dust every day. For years, my hair was white as snow and since I have been taking the gravel dust, it is almost black again. Chronic diseases (especially gout) disappeared. I think this discovery will be the biggest sensation of the century.

...While building this road... all the trees that grow there (spruce, Scotch fir, beech) have recovered completely from diseases caused by acid rain emissions. Since they have been exposed to the gravel dust, they grow 50% better than before. In the fall, the beech trees lose their leaves 4 weeks later than usual. Also, grass, herbs, blackberries, and raspberries grow like never before. The raspberries and blackberries taste better than those from areas not exposed to gravel dust...The deer population grew and prefers the exuberantly growing grass.

continued from page 4

until we die of starvation a few years hence." The people who say the cost is prohibitive know nothing about the cost of grinding gravel. And they do not know that the alternative is death. They do not know that the mining industry is already grinding huge quantities of hard tough rock, not that some and probably all of the chemical fertilizer companies are already using gravel dust as the filler in the sack in a vain effort to compensate for all the shortages. Shipping the dust is a cost passed on the farmer.

There is no way that remineralization put on a practical basis with efficient farm size grinders working local gravel supplies can cost half as much as chemical agriculture. But it won't happen as long as disinformation and the control of wealth over what is done in this country can prevent the changes.

I wouldn't say that you will find any "short sharp answers" in the above answers. You might just tell them that they are speaking from ignorance of the natural order. So far as this earth is concerned Nature is reality. When you stray far from reality you are getting over into insanity. That's just what the world is doing when it exploits the biosphere which gives life to all of us. That's "short and sharp" but it won't change any-minds.

I have noticed repeatedly that if an argument is clearly stated it will not be immediately accepted because of mental blocks in the conscious mind. But if it lodges in the subconscious mind which apparently deals with facts rather than beliefs, it will sooner or later pass back to the conscious mind what it perceives to be the truth. Some people however have such a strong capacity to hold on to beliefs with which they are comfortable that they can reject anything contrary to their beliefs as soon as they hear it. History shows that at best it takes several decades for changes to take place. We don't have time for a philosophical change in society from exploitation of man and nature to a responsible society which recognizes the necessity of taking care of man and nature. For that reason I am not much concerned about what experts think.

In the past when a majority have become dissatisfied with the performance of government a new party has formed to take over the government. That is the only way this country or any other can produce the rapid change required to face up to the things which must be done to enable civilization to survive. We are fortunate at this time to have a presidential candidate to lead a political effort to regain control of the nation by the people. What chance there

In agriculture, the distribution of the gravel dust is done by fertilizer machines. It is planned that helicopters will distribute gravel dust in the forests. This has the advantage that the dust will stick

### "I think this discovery will be the biggest sensation of the century"

Robert Schindele

to the tree's leaves and needles. This will ruin the teeth of pestilent insects and they can be exterminated without the use of poison.

Concerning Hamaker, I have to say that his theories are completely right and that we should mineralize not only the soil, but also men and animals with appropriate edible mineral rock powders."

*SR* recently received a letter from Christopher Bird, co-author with Peter Tompkins of *The Secret Life of Plants*, the sequel of which will be published soon and will include a few chapters on remineralization.

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is left for the survival of a portion of civilization lives with a change of leadership here and in other nations. I hope to be voting for Daryl J. Kollman in 1988.

Bruce Miller of Toronto wants a standard analysis for comparison of mineral content. The best one I've found was in the *Encyclopaedia Britannica* under Geophysics which gave the analysis of the earth's crust. He also is interested in spectrographic analysis of gravels for comparison. Such analyses are limited to 37 elements and several people have reported that you can never get the same analysis from different laboratories. Why waste your money? The *Britannica* tests used X Rays- very expensive and still only an approximation.

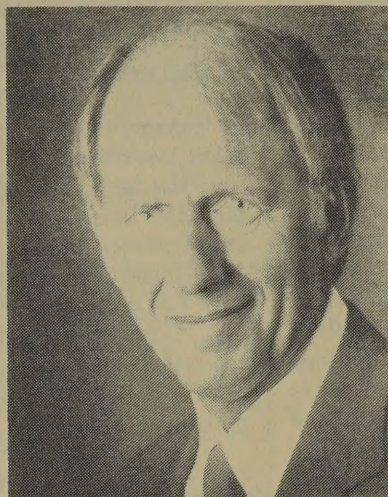
A lot of us would be very much interested in hearing from one reader (Bruce Miller) about the "superb locally available grinder" on which he has had a number of samples ground. The pits from which the gravel was ground is located in a glacial morainal area. He says he has not done any plant growths tests because spectrographic analysis show too little trace mineral content. From my experience I'd trust that gravel a lot more than I'd trust a laboratory test. I repeat, nobody knows, how many element or quantities of elements it takes to feed the soil microorganisms.

John Hamaker





### Elect Daryl J Kollman - President, November 8, 1988 State of the Union 10/1/87



#### Our Program A Comprehensive Environmental Recovery Program

As President of the United States, I will take action now to halt crippling damage to the environment; to eliminate the threat of disastrous climate changes; to prevent disruption of our food supply; and to assure the regeneration of our vital physical resources. This will include programs to implement:

- Widespread reforestation.
- Remineralization and revitalization of the nation's arable soils.
- Accelerated deployment of ethanol, solar, geothermal and other renewable, "clean" fuels and energy technologies.
- Comprehensive cleanup of existing toxic and hazardous waste sites; accelerated deployment of existing technologies to reduce and eliminate further toxic and hazardous waste.

#### A Comprehensive Economic Recovery Program

As President of the United States, I will take action now to halt the waste and erosion of America's economic and human resources; to eliminate unemployment and unproductive employment; and to assure our continued economic regeneration. This will include programs to implement:

- Elimination of dependency on fossil fuels.
- Revitalization of American agriculture.
- Comprehensive restructuring of the nation's defense spending programs.
- Re-employment of the nation's jobless, primarily in industries generated or stimulated by facets of the Comprehensive Environmental Recovery Program.
- Stabilization of international trade balance.

This is an excerpt from the State of the Union address.

You can join **Citizens to Elect Daryl J. Kollman-President**

Any size contribution will be greatly appreciated and carefully used. (\$1000 Maximum contribution per person.)

-For a contribution of \$25 or more you will receive the first "I Am A Friend Of The Earth" tee shirt. Beautifully designed in bold colors, this collectors tee shirt will declare to all, your commitment to your life support system...The Earth.

-For a contribution of \$150 or more you will receive the entire series of "I Am A Friend Of The Earth" tee shirts during the next 12 months. Each one of the six will be a unique scene that shows some view of "The Earth" that we all treasure.

-When you make any size contribution you will receive all the campaign literature including "State of the Union, 1987" a brochure of Daryl J. Kollman's major campaign positions.

#### Actions

-Make a list of friends to contact, to tell that **The Earth Can't Wait** and encourage them to join our efforts now to get Daryl J. Kollman nominated and elected President in 1988.

-Make a commitment to call at least one friend per day, and ask them to do the same.

-Make copies of our materials (or order more from our office) to distribute to your friends, and encourage them to do the same.

-Contact any interested representatives of media, speakers' forums, environmental organizations, or other potentially helpful groups, and tell them about our campaign. You may also send us their names and addresses for our mailing list.

#### Read & Discuss

-Order **The Survival of Civilization** by John Hamaker and Don Weaver. Share the book and information with your friends. Hamaker-Weaver Publishers, Box 1961, Burlingame, CA 94010. Cost \$12.00.

Enclosed is my contribution of  
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Make checks payable to: Daryl J Kollman  
Campaign For President. Send to: P O Box 1888,  
Klamath Falls, OR 97601



## *Long term experiment shows extraordinary results remineralizing forests*

Long term experiments have been carried out by the Bavarian Research and Experimentation Institute For Forestry in Munich, Germany and the results have been released in 1986. Gesteinsmehl (stone or rock flour) is defined as being minerals from a silicate source. In Germany if there is more than 20% magnesium it can be referred to as a fertilizer.

In the study examples are cited of the use of rock dust in antiquity (with reference to the research of Helmut Snoek). More detailed

research was first conducted in the middle of last century.

The study also says that its effects in agriculture are difficult to quantify, positive effects were claimed but "scientific proof" was hard to come by because of the multitude of influencing factors. The case of the Nile sediments is a valuable analogy for its positive effects, but not "proof".

The situation is different in forestry. Here there are exact quantitative results that

prove the successful application of gesteinsmehl. These experiments were conducted over long periods of time. In the case of new pine seedlings the area treated with basalt rock dust showed gains over the untreated area after the 6th year. After 24 years the wood volume was four times higher than in the untreated area and it was only after 60 years that the advantage tapered off.

They stressed that the finer the rock dust the better the effect. For application they recommend 50-100 dt (german tons) per hectare. For agriculture they recommend 3-10 tons per hectare. For a single tree they recommend 1/2- 1 kg per tree. A mixture with compost or manure is highly recommended.

The report points out that the relatively slow results have a positive side in that there is not a sudden

component is oversupplied, thereby avoiding any imbalance.

The Research and Experimentation Institute for Forestry in Baden-Wuerttemberg has had good results with horticulture plants using rock dust. 10-

**"... after 24 years the wood volume was four times higher than in the untreated area."**

15% basalt rock dust was added to the soil in their experiments. The soil consisted of 1/3 humus, 1/3 peat and 1/3 compost.

The report and study was positive throughout on the use of rock dust.

con't from pg 5

In the letter Schindele says that in 1986 almost all the leading newspapers and magazines in german speaking countries and many international publications issued articles on the subject, along with coverage from many radio and television programs.

There were so many customers that there were lines of cars several kilometers long, and it became a kind of pilgrimage, like Lourdes.

He began building his own mineral processing facilities and now produces and sells the mineral product *Superbiomin* to all continents, finding especially widespread use as a food supplement. The whole thing was a huge sensation.

He reports that on the basis of the many reports received from customers and doctors all over the world and through his experience he can "prove" that a majority of all diseases can be traced back to mineral deficiency. Drug sales dropped noticeably as a result of the sale of the mineral product in some parts of Germany, according to the report of a pharmacy and the pharmaceu-

tical industry then launched a huge campaign with the intention of discouraging the general public from further use of the product.

Nevertheless, this campaign was apparently not enough and the Minister Presidents of each German Federal State decided to declare *Superbiomin*, which was already being sold in 6000 German pharmacies, as a drug requiring registration as such, and as this had not been applied for, the import of the product was prohibited. The measure cut back sales by 80%. The pharmaceutical industry knows that there is little to be earned from healthy individuals.

In the meantime they have been granted registration as a "mineral dietary supplement" and it can now be imported to all Common Market countries.

It seems also that *Superbiomin* acts against radioactivity. *Superbiomin* was examined at the University of Vienna under a micropolariscope. It revealed an alteration of the atomic lattice and the molecular lattice with a regression to orthoclase, a process which generates an

electrical potential which changes its polarity each time it is emitted, thus producing plus and minus electricity alternately. Moreover it was discovered that the mineral product has a positive pole, cell membrane stimulating magnetic pulsation termed DIN OD 144, according to Dipl. Ing. Gill. Via the alteration of the atomic lattice, the relatively large amount (approximately 10-15 g per day) which is recommended as a daily food supplement has an effect on any ionized radioactive particles taken in by the body. It breaks down the high oscillation rate of such particles, thus rendering them innocuous. This effect has also been confirmed by a Russian institute from atomic physics in the Ukraine.

After the atomic reactor catastrophe in Chernobyl the Russians picked up 2000 kg of *Superbiomin* with a military truck.

"*Superbiomin*" consists of 30% orthoclase (also referred to as potassium feldspar), 20-30% plagioclase feldspar, 20-30% quartz, 15-20% biotite, 5-10% disthene, garnet and sillimanite, as well as iron, zircon and rutile.

J.C.



# A Dramatic Recovery in Brixlegg Forest

documented by engineer  
Georg Abermann



Georg Abermann indicates the dramatic growth of this tree since it was remineralized. (photo taken in 1986) The growth for one year is the distance from branch to branch and you can see where the growth really takes off and how little growth took place before remineralization.

*This interview with Georg Abermann took place in June of this summer while filming the recovery of the remineralized tract of this tragically dying forest.*

**Georg Abermann:** What I cannot understand is that the responsible forest people could have said 3, 4 or 5 years ago, let us make an experiment on 20, 40 or 50 hectares. We can put there this quantity of rock dust, and we want to know if it works. If they had good will!

They put in lime and they know that lime is too alkaline and destroys the humus because it destroys the acid-alkaline balance. Lime destroys the nitrogen compounds in the humus and it leaches nitrogen into the water which is a pollutant. Measurements show that with acid rain comes about 40, 50, 60 kilos of nitrogen per hectare. For example,

they use about 100,000 tons of lime in agriculture. If this use of lime were changed to the use of steinmehl (gravel/rock dust), the lime industry would not like it and they sit in the government and everywhere, and the chemical industry too.

The forest in Brixlegg is something special. It is a dying forest because of the industry nearby.

Before we put the gesteinnmehl there they told us it will not work because of the heavy metals and they told us gesteinnmehl can't help against the heavy metals. And after six months after the first application the trees grew better and the experts could not explain how this was. One of the biggest

experts is responsible for the area of Tirol. I had to go three times to this man to get permission to put gesteinnmehl there. The third time he said I believe it may bring results but I will not report it because the industry will not put in the filters.

They tried to avoid other possibilities to help the soil. But the soil must be helped to make trees grow! Without help the soil cannot regenerate. This was confirmed by this expert. He always said, "no we don't want documented [evidence]".

He is responsible for the area in theory. He works for the government and tried to avoid verification of gesteinnmehl. At least he said if you don't call the press and media you can make it quietly.

**Joanna Campe:** *Remineralization has been used in dairy farming, and I understand there is less cesium and iodine (due to Chernobyl) in the milk as a result.*

There are 3 cheese factories very close to each other in the same region. Only the factory with the farmers which are using for 5-6 years already rock duck dust, only these produced milk that was less radioactive.

[They had] Less than 50% of readings of others in the same area. In the cheese there is no radioactivity, nothing. In the other factories they have high

levels of radioactivity. It is proven by the government from official readings. In the beginning the milk was 50% less radioactive and now in the cheese there was no radioactivity at all. This information came from the man who took the samples. He is a farmer.

This better cheese is demonstrated with the result of selling. Once a month he sells his cheese in Innsbruck and people sometimes wait half an hour to buy this cheese, because of the taste, even though the price is higher. And the cheese is 8 or 9 months old. He gets a higher price and it is also documented in the exports.

The dairy industry is beginning to show some interest in these facts, milk quality and so on, but it takes years and years for these people to change a little bit.

In upper Austria stone meal is used to raise cereals for feeding pigs. They feed the stonemeal directly to the pigs. When the pigs were 60-70 kilos they had to sit down because they were weak. Normally the pigs under natural conditions get out and eat earth for minerals, even old cows do the same. After the winter there are old cows who know at what place to take the earth to eat. And if you give them rock dust they eat it. We have farmers who give rock dust regularly with the feed.





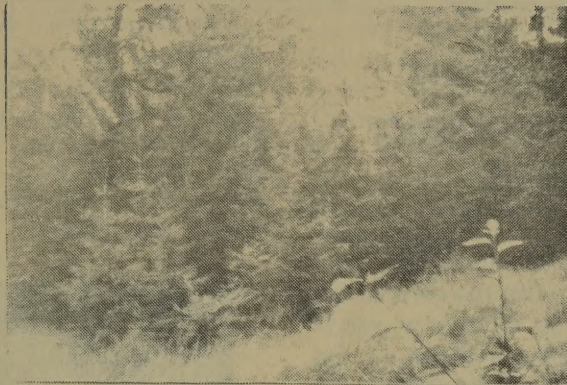
Dying older trees in Brixlegg forest.

Pigs that are fed with chemicals are so weak that when the door is slammed they become frightened and die of heart attacks. And when they are put in trucks and sent to market they are so fearful that they break down and are dead on arrival.

If you get in the hospital with a heart attack the first thing you get is magnesium. I can give you 23-24 problems with human health coming from magnesium deficiency. Magnesium deficiency in trees and in humans is the same. The mistake that man makes is that magnesium deficiency is to be corrected through magnesium. You have to bring all minerals in the food and in the correct proportion.

There was a man [Robert Schindele] cutting a road through his forest. And by doing this he blew a lot of rock dust into his forest. And one to two years later he noticed that the trees which were not well started to improve. He thought about the reasons for this.

He set out with a mill to grind his own stone and do everything that Hamaker wants people to do. This was the time we met him and when I found out there was a person nearby who would



A healthy stand of spruces in the remineralized area



A stunted baby tree

be proof for Hamaker's theory I made a big roundup of forest people and officials and scientists and we all went to the forest... and all the forest people were very sceptical and especially one high ranking official.

He picked out one tree that looked very bad and said to the forest owner, 'if you can help this tree by applying rock dust I will kiss your feet.' We all laughed but I said tomorrow we are going to do it and we did. The tree recovered very soon. It has quite another color but then it was very old and we didn't know if it will live on... This was the first example that showed some proof. From there we are going on with large and small... After a few weeks the official came back and saw the tree was recovering. We'll see what happens. Maybe someday he will kiss Schindele's feet!

The bottom section of the tree to the right bushes downward, a typical Waldsterben symptom, while the upper half, clearly a spruce, shows normal healthy growth since remineralization. It almost looks like two different trees grafted together.

*Sanvita is 8 or 10 years old and the largest producer of diabase [rock dust] in Austria. The trees should be in good health here because of the dust blowing.*

They are. There are farmers who came here and looked at the trees before using our rock dust. You cannot say that the trees are better in general because we make here lots of different materials and the trees are damaged. But where the trees stay in their place undisturbed they are well.

For 7 years the establishment has not used [rock dust]... The scientist says the buffer capacity of lime is greater [than diabase] and therefore lime is better. ...The expert [then] says why should I take something which is worse?

*They are thinking only of the buffering capacity and not the whole picture.*

Yes, and we must be more precise than the experts. And we must avoid examples which can be misinterpreted.

*What stage of production of gesteinmehl are we seeing now?*

There is no step here, only the last step- there are only two ways to produce it. One way is to produce it for itself [presumably direct grinding into fine dust] and the other way is to filter it out of the other production of stone and you clean the filter and you have gesteinmehl, like cleaning the filter of a vacuum cleaner.

*What is the size of the fine materials left over?*

We count in millimeters from the smallest at 0 mm. to the biggest which is 0.09 mm.

*Do you know Hamaker's work about the climate and cooling?*

I only can say it is very unusual that there is still snow on top of the mountains and it is now the end of June and in two days we will have the longest day [June 21]... We have never had snow on the mountains at this time before that I can remember. Sometime it snows in July and August but only for a few hours. In the valleys and caves there is snow for two weeks more... two weeks later than usual because of the late snow in April and May.



# European shooting of a film documentary Summer 1987

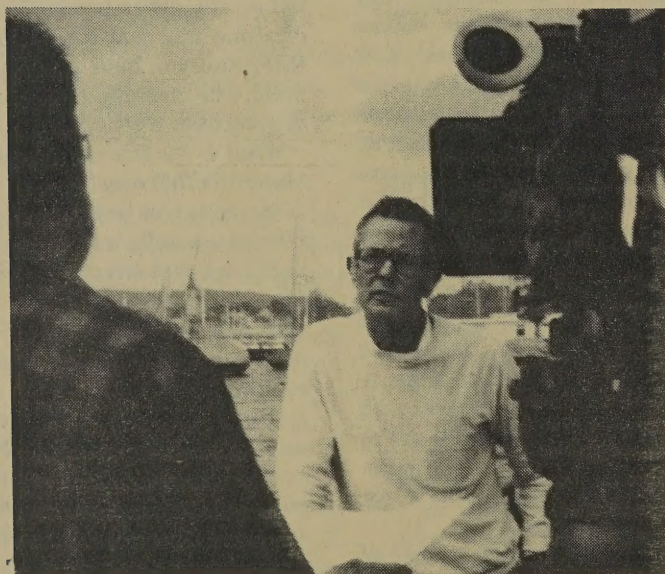
Larry Ephron of the **Institute For A Future**, cinematographer Stephen Lighthill and Sound specialist Nelson Stoll arrived in Vienna in the evening rather than morning, already forcing a cancellation of one day's shooting. Extremely stormy weather forced the NY flight to land in Zurich where marooned with many other waylaid flights. A documentary on weather extremes and already waylaid by extreme weather! During the ten days of shooting to come the rare sunshine was very much appreciated by us as we gradually became accustomed to the chilly rain.

We were also joined by Dutchman Piet Bouter- ( he appeared on the cover of *SR* #3-4) he offered to assist wherever possible so he could follow his passion for remineralization. Hardly anything makes Piet happier than the sound of rock crunching- as if in the very sound he can hear the explosion of microorganisms in the soil to come, and mother earth springing to life...

I was to be the glue-bringing together the film team with those who are concerned with the climate crisis and remineralization- the European branch of our movement in Austria,

The trip covered 3,000 km of travel by van and car in ten days along with the many hours of shooting the film along the way. There were beautiful vistas of the alps, and the cities of Vienna, Zurich and Munich were

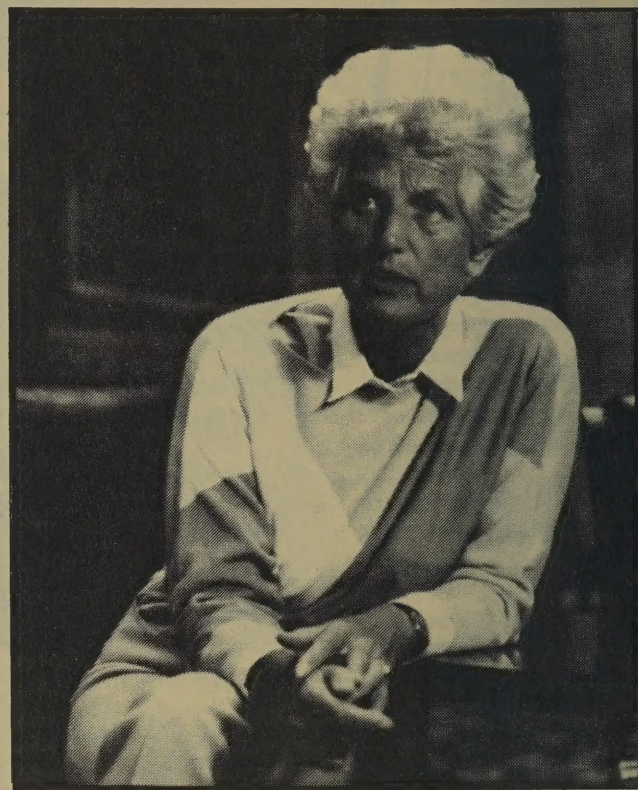
cold wave of the year which killed many of the vineyards in Hungary. He said that it is not just the record cold- this is the factor which finished them off. They were already weakened and dying trees. Healthy trees are much



Larry Ephron interviews physicist  
Pierre Lehmann on the lakeside in Zurich

Along with Larry, Stephen and Nelson we linked up with a camera assistant in Vienna. Andreas, Canadian-Austrian, who saw a note I'd posted on the bulletin board at the Vienna Film School. Andi's fluent german would come in handy.

and Germany. In Europe, after all, they've been remineralizing agriculture with rock dust for decades and have good research as a result- some impressive facts and photos with which to support our efforts in the U.S.



Frieda Meissner Blau at the Austrian Parliament

Austria is idyllic when one thinks of the Alps, but they are very threatened by Waldsterben, forest die-off. Hallstatt, an ancient town near Bad Ischl may be evacuated and abandoned in the future, as the trees die and the mountainsides erode- the avalanches are too precarious- a tragic fate that awaits thousands of villages and hundreds of thousands of inhabitants of these dream-like villages in the high alps in Austria and Switzerland.

In Austria a documentary recently covered the evacuation of two villages in the Voralpberg, the Austrian alps which border Switzerland. I saw many dead trees and asked Dr. Graefe if this could be due to the record

We began shooting the next morning at the Austrian Parliament. Maria Felsenreich had arranged for us to interview the Green Party member of Parliament, Frieda Meissner Blau. She ran against President Waldheim in the recent election.

Her office, living up to green ideals and very modest, we chose to film her in an ornate room hung with male portraits, looking like a British men's club! She protested slightly at this which was understandable- and yet we wanted to capture the impressive parliamentary setting.

It is impressive that the greens have made it to Parliament as in Germany. A



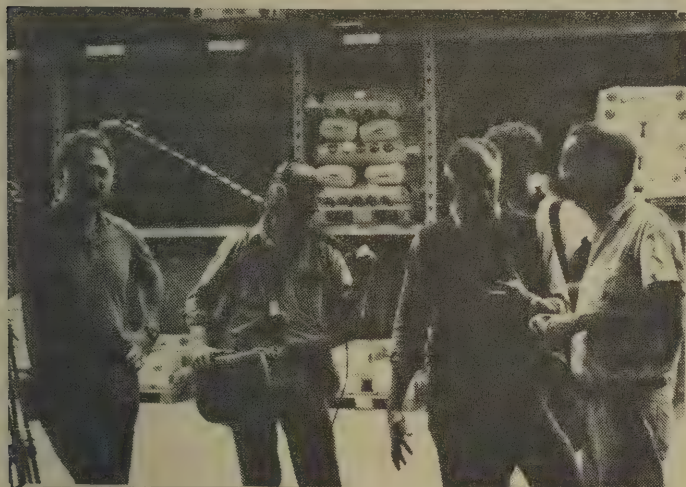
government pays each party for each vote it gets and the party does not need to win a majority to get a seat in Parliament. In a first election the Greens in Germany at \$3.50 per vote received \$2 million with which to begin their party and campaign. They now make up 10% of the German electorate. The American two party system does not encourage the formation of a third party.

From there we drove to Stuhlfelden in the Hohe Tauern Alps to the southwest of Salzburg. There we met Mayor Steiner, the mayor of the village of Stuhlfelden and Alfred Winter. He is a publisher, has organized major museum shows and international conferences. He is also working with the Salzburg government, managing the cultural affairs and development of the villages within

seemed to be in need of this rock dust, much more than a locally available rock dust. The mayor will, it looks like, turn the "waste" into a product to be sold for agriculture. Mayor Steiner ("Stone")

a trial for remineralization because a lot of research has already taken place there. It is known for example, that a lot of heavy metals can be found, especially copper, from a nearby factory. Aber-

The village of Stuhlfelden didn't have a waste disposal problem for rock dust any longer- it had a surplus resource for organic farmers and forests in the region.



Filming at the Zimmerli factory

In our interview with Meissner Blau, she spoke about a remineralization project for forests that was sponsored by the Green Eco-fund. A percentage of the salaries of the members of parliament goes into this fund. The fund helped to finance remineralization trials of 25 acres for 10 forests- about 2500 acres in all.

There is also an organization called **Bruder Baum** (Brother Tree) and they have begun remineralization actions in the Vienna Woods. Maria encourages remineralization accompanied by *Biovin*, a humus building complex made from grape residue and developed by Dr. Gernot Graefe, which acts to potentize the remineralization. The soils in dying forests are missing minerals and organic matter, and the combination is ideal to heal the dying forests.

Alfred Winter has been personally interested in rock dust for many years and used it in his own garden. He discovered within the park, a large deposit- so large that the village of Stuhlfelden had problems disposing of it. The remains of a mining operation out of which tungsten is separated for light bulbs- the left over dust was being buried in a lake. He realized that the village didn't have a waste disposal problem- in fact, it had a surplus resource. They have since encouraged its use- mainly to organic farmers in the region.

Mayor Steiner is an organic farmer himself. It is interesting to note here that Dr. Graefe observed that the forest growing alongside the lake was unusually healthy. He and Maria Felsenreich also found that one forest in another part of Austria

treated the film crew to great hospitality- a big dinner in a local restaurant and an overnight stay at his inn.

We drove through the beautiful alps in the Hohe Tauern, to the alps of neighboring Tyrol and to Kitzbuhel, the small town famous for its daring downhill skiing slalom and a home of the Olympic games.

We went to Hartsteinwerk- the largest gravel operation in Austria which

mann had expected to see results within 1 1/2 -2 yr but found noticeable results within 5 months.

Now 5 years later you could see a healthy stand of spruce trees amidst the dying older trees. One tree was especially striking- bushing and growing downwards, the bottom half was hardly recognizable. The second half, with a clear mark to separate the new growth stretched skyward- clearly a



Mayor Steiner and Alfred Winter at rock dust filled lake in the alps near Salzburg.

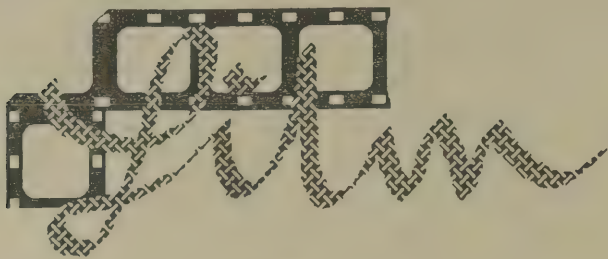
also produces *Sanvita* for the last 12 years- diabases, a kind of basalt and one of the most popular types of rock dust used for agriculture in Europe. We met with Mr. Cerwinka, the owner, his son and engineer Georg Abermann. Abermann remineralized a few hectares of forest in Brixlegg, an hour's drive from Kitzbuhel. (story pg 8)

Brixlegg forest clearly suffers from Waldsterben symptoms and he chose it as

spruce- it looked as if a bush and tree had been grafted together. There were also wild strawberries and plants growing out of tree stumps- not seen elsewhere in the forest, clear indicators of new soil life and vitality. The old forester said he saw a difference even in the giant old trees.

From there we drove to the border- across to Germany to visit with Helmut Snoek, the author of "The





Copies on Film and Video  
will be available

## Near Completion of the Documentary

# Stopping The Coming Ice Age

My film, "Stopping the Coming Ice Age," is almost finished. Robin Williams, the actor and comedian, may introduce it. It should be ready for distribution in 6-8 weeks. We spent 10 days filming in Europe last June, with Joanna Campe (with the assistance of Dr. Maria Felsenreich) organizing all the meetings with people involved in remineralization- people like Frieda Meissner-

Blau, a Green member of the Austrian Parliament, and George Abermann, who remineralized part of a state forest in Austria, with dramatic results. We also interviewed atmospheric physicist Pierre Lehman, by the banks of the river in Zurich, and many other people.

Copies of the film will be available, on VHS and Beta (\$19.95 to individuals,

\$29.95 to groups), and on 16mm (\$525 to individuals, \$650 to organizations) as soon as the film is completed. To order, contact the Institute for a Future, 2000 Center Street, Berkeley, CA 94704. (415) 524-2700. Tax-deductible contributions are also urgently needed to publicize the film, and my forthcoming book on this material, "The End: The imminent ice age and how

we can stop it," which is being published by Celestial Arts and will be available through the Institute for \$7.95 plus \$1.50 postage and handling about February 1988. Quantity discounts are available: 10 or more at \$7 each, \$25 or more at \$6 each, postpaid.

Larry Ephron

continued from pg 25

Book of Rock Dust" at his home. A long interview of Snoek appeared in SR #3-4.

That evening we stayed just on the Austrian side of this tri-country border where accommodations were less expensive. In the morning we drove to Zurich where we had a meeting with Pierre Lehmann, a nuclear physicist and mathematician, who came by train from Vevey, the french part of Switzerland. We met at the Restaurant du Nord, across from the train station. We decided to film him by the lake and chose a beautiful spot with the city in the background. We were lucky enough to catch a time in between rain showers- the lake was unusually high and the waves occasionally swept onto the sidewalk. Poised lake-side with cameras and ready to ready to shoot, swans kept swimming by, hoping for a hand-out.

Pierre spoke about climate, a recent meteorological conference he attended and remineralization for saving dying forests.

From there we visited the Zimmerli factory and its owner Hans Rutz in the outskirts of Zurich. Rutz has been selling rock dust for agriculture for decades and makes available many mixtures for different purposes and soil types. In the entrance are glass bottles

Inside the factory was a huge machine in which different mixtures/recipes are punched out and the dust is mixed together and bagged, ready for national distribution.

We spoke with an engineer who described for us the background on rock dust and its uses and the research of Hans Rutz. We filmed Rutz in german- Schweizer deutsch- a swiss german dialect with *li* on the end of

trees are dying. Unfortunately, we were not able to film there due to lack of time and bad weather and sped on to Munich where we interviewed Professor Koch of the Forestry department of the University of Munich.

In the interview he emphasized the need for remineralization for forests and agriculture and showed us impressive photos from the research of Fritz Leipold which has taken place over the last thirty years. I hope to have permission to publish the results and photos of this research in a coming issue.

From Munich the film team flew back to California to finish the film. It is hoped this documentary will spread its message far and wide. It will soon be completed and available in video and on film.

Joanna Campe

## The Austrian Green Eco-Fund helped to finance remineralization trials of 25 acres for 10 forests- about 2500 acres in all.

filled with varied rainbow hues of rock dust from different regions of Switzerland in different gradations of size from pebbles to incredibly fine, less than a micron in size. A beautiful photo, I thought...click!

many words. He told us some marvelous anecdotes of remineralization experiences.

From there we drove to Freiburg to film a skeletal dying forest within the Black Forest where 95% of the trees are dying- harbinger of



# An Interview with Physicist Pierre Lehmann

*This interview took place in Vevey, Switzerland in the summer of 1986, with Joanna Campe and was transcribed by Bertram Cohen.*

Well, my life is very simple to describe. I studied physics in Lausanne and I worked for 3 1/2 years doing nuclear physics in Switzerland in 1957 to 1960 with the idea to develop a nuclear power station of Swiss manufacture. Then I quit and went for 12 years around the world with a company named Schlumberger. ..After a while I decided I couldn't work any longer for a company whose main purpose was to increase its turnover by 15% per year...If you asked until when, it was a bad question. It had to be forever. That was more or less understood. So I decided I could not understand something that would increase 15% per year forever. Something must have been wrong with the basic [out] look of that company.

So I quit and I started this little company here about 15 years ago which is **SEDU, the Society for the Study of the Environment**. We did science as usual but finally we realized it was nice to calculate how pollution was moving about but it was wiser to prevent it from entering the atmosphere. And progressively we put more emphasis on renewable energy, fighting pollution at the source, etc. Today we do half of our work in pollution problems and half in fields where we don't work for subsidies.

*When did you come across the Hamaker book?*

That is an interesting story. I have a friend who works for state TV in Geneva. He told me his film on the Amazon rainforest was to be shown on TV. And he showed C0/2 and how it was going to warm the earth. I told him I read Elsaesser's paper [Hugh G. Elsaesser, Lawrence Livermore Laboratory, *The Climatic Effect of C02, A Different View*, Atmospheric Environment Vol 18, No. 2) which questions the conventional warming scenario]...and I sent him the paper. He got Hamaker's book from Renata Meier and sent it to me. He showed Elsaesser's paper to two or

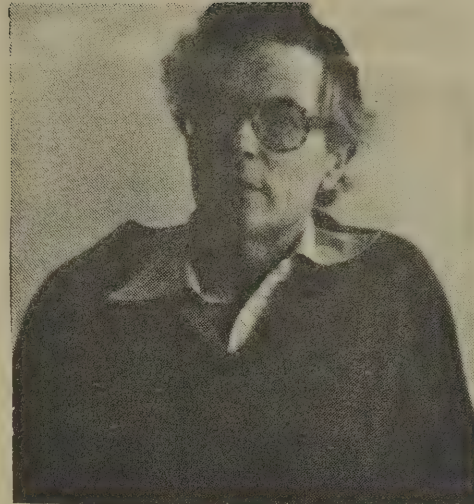
three of these warming guys... The reply was extremely strange, that this view was not the view of the C0/2 community- period! That was all they said. It was just dismissed as a lot of nonsense.

So when I went on vacation I decided to read Hamaker's book. I found it was a good attempt at a synthesis... But I am not trying to promote the Hamaker gospel. It is a very good work and a good idea to have published it and put emphasis on things people usually don't emphasize and all these scientists with their nice mathematical models forget. On the whole I believe Hamaker is more on the correct side. But I would not make a gospel of it because the whole thing is so damn complicated. There is a very good possibility that what Hamaker says is correct and that's good enough to credit him for having said it, written the book and putting to the public an idea which will force people to think again about it a second time.

And I feel there are instabilities in the climate and the atmosphere [which] may have several levels of semi-equilibrium. I'm afraid that the phenomena of changeover might be extremely sudden. So it means we should be extremely careful. And I see one good thing about Hamaker's book in addition... it frightens the hell out of people so that they should at least start doing something.

It should end up by having the behavior of people change...The whole problem is how should I behave in order to maintain the biosphere in a living standard?...We have to become more modest towards the achievements of our brains and our science and if we don't do that then no matter what the climate does we are doomed because we are just programming our own suicide. That's what makes me afraid. If it gets cold and we stick together we may get through it. But we must stop believing we have the right and the duty to dominate the whole thing with our science.

*What you said about suicide, and that we are going in that direction...In one way it is so evident, so absolutely evident, but for most people its not so evident and that is frightening...*



Besides most people feel there is nothing you can do about it. And that is, of course, bad because even if it is small whatever is done [helps]. My experience is that if you do something yourself which is out of the way and people can come to see it then at least they have seen. With my composting toilets I have had vast loads of people coming to look...People don't come to me to look at my view, they come to look at my toilets! And quite a few of those decided later on to do the same. Of course it is a small thing. There are not huge amounts of people who have done so, perhaps a few hundred. It may sound strange but I think if we succeed in introducing composting toilets on a large scale then we might solve humanity's problems but not otherwise. It might be a strange statement.

*It think it is a revolutionary thing. It involves an enormous ecological consciousness in people...*

*You visited the forest of Schindele and his "fortuitous accident" in which gravel from building a road had blown onto his dying forest. What was your impression?*

Quite a few trees made very strong growth, and you could see that the trees were in bad shape before. And Dr. Graefe showed that the soil was in a very perilous situation which means that the roots of the trees could not penetrate deep into the soil. They had to spread very close to the surface.

So it was a condition, quite good, for stone dust to be effective rather fast. Now I'm not an expert on trees so I looked at it and it looked convincing enough. But I could not make a definite statement. But I made an experiment



## Interview with Pierre Lehmann continued-

with trees in my garden and the results were quite good.

I have Helmut Snoek's book on rock dust (*Das Buch vom Steinmehl*). I read it and it is a good book. I have a personal experience with two small apple trees that were planted 10 or more years ago. They were never in good condition, I do not know why. They would produce huge amounts of small apples but would never grow any branches or wood. So last autumn I went with my son and we put on stone dust and *Biovin* under one of those two trees. This year this tree is making branches 50 centimeters long and the other tree has not done that. We applied just very little of the [rock] dust. The other tree is 6-10 meters away and it has not changed. I cannot say it's a proof but it is a good indication.

Schindele claims if you eat his stone dust you become healthier, your hair will become darker, etc. Suddenly this has upset a lot of people, the chemical industry and others.

..One should really go after the question and ask whether or not it is good for you to eat an occasional spoon of stone dust- after all why not? If you imagine you are lacking some elements or minerals and if by some chance you get that very mineral out of the stone dust then it may help. I don't see why there should be a negative feeling against it. I think we should promote the idea that some institution should do some kind of scientific work on it. For once science will be useful! You could take a bunch of guys with different illnesses, feed them the stone dust, the way we do these things, and then we will know if it works and not just say it is nonsense.

..The point is whether or not some reasonable [amount of] stone dust can help people with such and such an illness, that is the main point...I'm certain that even if you get minerals in very small amounts in the stone then there is a probability that if you eat stone dust and if you are lacking something you might get it back. So I don't disclaim that such a possibility exists and I don't see why it should not exist. ...Schindele is famous and has been printed [publicized] all over the place.

I tried to look into the stone dust business. Mainly I have contact with Dr. Graefe in Austria. That's someone who is a scientific man who also lets

imagination speak as well and who tries to find experiences and explanations in a way I do like. We did some stone dust experiments here in Switzerland. So far I am unable to tell you the result.

*When did you initiate it and how did you do it?*

It was very difficult. I initiated it last year. I tried first to have the official forestry people do it and they did not like my intruding into their busy lives...So having no response from official people we had to do it ourselves. And so in December of last year we used 10 tons of stone dust.

*What is the makeup of the dust?*

I do have the analysis of that powder. It was provided free of charge by Zimmerli [the rock dust company in Zurich]. It is a mixture, a magnesium-rich stone dust. It was light grey in color. He [Hans Rutz, the owner] has several kinds. When we were ready to start he took samples of the soil, and an analysis of it and found magnesium was lacking. Then he decided on which kind of dust to give us. It was very, very finely ground. We put it on at about one kilo per sq meter. (about 2.2 lb per 10 sq ft.).

We must have done about 10,000 sq meters altogether. We did it on several places with different soils. I went back recently to one place where we had done it but the whole forest is collapsing. It's in very bad shape so I could not be quite definite about anything in particular. So it is too early to tell. There might be better results in parts where I have not checked. We should go back late in September to all these places and look at them. According to Dr. Graefe's suggestions we should also look at the soil. He said to look at the soil where you have put your stone dust and look at the soils next to them where you have not. And try to find difference between the soils, if there are any, because that is your first indication that something is happening. And we have the cooperation of the University of Lausanne, of soil specialists, of people who are willing to do the work.

If a difference shows up it would first be in the soil whether the trees will recover right away, or a year later. Dr. Graefe says that in some places the effect will be very soon and in other

places it will be delayed depending also on the amount of rock dust put on the soil. ...This is an experiment we have made and we seem to know that the Swiss forestry people are now trying to revitalize the soil and the forest and they don't want to tell us what they are doing. But as far as I can tell they are also using stone dust, at least as a component of it in a mixture. Dr. Graefe says it is a good idea to add grape residue products in the way he prepares them in Austria as a humus builder at the same time...*Biovin* is a good way to do it.

I think it is going to be very important to have organic matter put back into the soil to be...humus again because if you think of the problem Hamaker speaks about, it's a problem of storing carbon and taking it out of the atmosphere where there is too much.

So how do you fix carbon? You can fix carbon in living tissues but there's the residence time and the carbon in living tissues is perhaps 10 years. If you take the average of your age, of the grass age, of a elephant, a cat, etc you will end up with something like 10 years residence time.

So if you [consider] humus, the residence time is close to 100 years or more. The carbon that has been fixed into the humus will stay there for a least 100 years so this is why you should build up humus by all means. And one way to do that is to stop incinerating and starting to compost wide scale. And this is not the only reason but it is a good reason why one should go over to composting toilets for example because you are turning into humus what would end up in a burning station. ...It will have created solid waste materials to be transformed into useful materials which can then at the same time fertilize soils again.

I think this problem of looking at the relationship of what individuals are doing if they make compost and the general problem of, say, excess CO<sub>2</sub> in the atmosphere- this relationship must be emphasized. Because if everyone composts properly, making humus which will store carbon for 100 years, that will help a lot in keeping CO<sub>2</sub> contained in the long run where it should be. If I cut the grass I make a heap and let it rot away and create additional humus. But today the whole of civilization is programmed in a very different way.



# Colloidal Links in the Soil

a paper presented by Dr. Gernot Graefe

*This paper was translated from german by Dr. Maria Felsenreich and presented at the General Systems Research Conference held in Budapest, Hungary on June 1-5, 1987.*

The reproduction of living species follows the law of exponential growth. By doubling, every species could, theoretically, reach a point where its gigantic populations would be forced to incorporate the bulk of biomass available. This never happens because scarcity impacts at a much earlier stage. Apart from this, massive reproduction of species is prevented by competition for limited resources among the diversity of species and by their opposing interests.

Man emerges from this existential framework and has become conscious of many deficiencies which cause considerable pain. Yet human consciousness still seems poorly equipped to form an idea of what is really essential for life on this earth. Man does not seem very capable of foreseeing the course and the effects of his own exponential growth. His ability to make use of nature's effective way of building up ecosystems seems just as feeble.

If there are reasons to believe that competition prevents massive reproduction of one single species, we may assume that self control was not a main issue for selection in reproductive processes, and that consequently, man was not forced to build up perceptual ideas about how nature works. The history of Homo sapiens followed the evolutionary pattern: self control is not desirable in the field of reproduction since it could become an obstacle whenever ecological niches turn up which invite colonization. So, Homo sapiens left his ecosystemal environment some 10,000 years ago without proper security measures against his rapidly developing ability to overcome obstacles, kill pests and nutrition competitors, and become a paragon for exponential growth. The only built-in security measure is his rising consciousness.

In order to direct man's "dualistic vitality" towards achieving new forms of integration with the ecosystem, he is confronted with population densities and the degenerating effects of industry on the ecosystem. At this point, General

Systems Research could show that this integration, i.e., alleviation of problems, will lead us back to the soil. In the future there will not be a single field of research, be it the Sciences or the Humanities which could afford to exclude the soil from its referential system. It would, otherwise, degenerate into nothing more than an auxiliary science.

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**"Basically the thin layer of soil represents a level for exchange and buffering which is much more crucial to ecological balance that is acknowledged yet. Therefore a realistic assessment of soil potential and value for ecosystems, as well as for global phenomena such as world climate, will be necessary."**

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Soil as a regional component is so important in that it entails the potential for regulation and improvement. Global phenomena, e.g. world climate, represent grave dangers, but their specific interactions with each region show a spectrum of phenomena, from destruction to beneficial effects. Basically, the thin layer of soil represents a level for exchange and buffering which is much more important for the ecological balance than is yet acknowledged. Its in-

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**"For our century the most important challenge is the acknowledgement that soil is the basis for our past, present, and future existence and a factor for the climate phenomena which are dangerously speeding up."**

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herent value to the ecosystem, as well as such global phenomena as world climate must be recognized. Soil has been the life-giving element for the blooming human population, but the ignorance of man as to its efficiency to preserve existence on the globe has caused a vacuum which should now be filled quickly by Systems Sciences.

Life developed in the ocean more than three billion years ago. Water was not scarce and nutrients were available in solution, as well as in hydroponic. Some hundred million years ago, terrestrial biotopes had to be conquered step

by step. The carbon forests were located in swamps. Where humidity remained constant, vegetation pushed on into terrestrial regions, but it didn't cover large expanses. At that time, terrestrial land consisted mainly of rock and stone rubble which was not able to hold humidity for longer periods: organic material and links for building up long-lasting soils were not yet to be found.

The mineral masses of the terrestrial biotopes represented a challenge for the exponential growth of microorganisms, plants and animals. The step-by-step colonization was successful and reached its height twenty million years ago when grass was covering large continental expanses. Colonization of terrestrial biotopes and the build-up of soils has been the main challenge of the past three hundred million years. In this century, the most important challenge is the acknowledgement that soil is the basis of our present and future existence and a key factor in the dangerous climate phenomena which is gaining speed.

My personal knowledge of the problem of soil has benefited greatly from the works of high ranking scientists in the USSR, the German Republic, Hungary, and the USA. These scientists as well as many others have supplied the ground-work for further research and action which must take place before the turn of the millenium: a cooperative comprehension instead of knowledge-

accumulation by elites. The latter, part of our ecological fiasco, could be afforded only on the basis of ecosystems in full swing. Our time is one of rapidly degenerating ecosystems. As far as the eminently important soil problem is concerned, experts whose achievements and limits are evident, are not the sole element needed. Further work on the question of soil will preferably be done by those who are not only able to understand the subtle system of linkage between organic and mineral material in the soil, but can also supply a framework for the re-structuring and re-building of the soil on all levels.



The colloidal system of the soil could be called a universal meeting point, a place for reality and integration. For instance, organic and inorganic chemistry, split on academic grounds, meet perfectly as a structure-building, functional unity in the clay-humus complex. While in inorganic chemistry some thousand compounds are known today, organic chemistry has described some hundred thousand. Based on its ability to undergo double-bonds, carbon is free to organize in large varieties of configurations. Although it belongs to those elements which are relatively less abundant, it prefers to accumulate wherever it is needed most in the biosphere. On the other hand, one abundant element in the stone-cover of our planet is silicium. It is never to be found in its pure form. It always combines with oxygen, the most abundant element.

C and Si both are quadrivalent. They follow each other vertically in group IV of the periodic system of elements, and they both build oxides ( $\text{CO}_2$  and  $\text{SiO}_2$ ) which react quite differently in building up larger compounds of

**"Our time is one of rapidly degenerating ecosystems...not only experts are needed, whose achievements and limits are evident. Further approach into the questions of soil will preferably be done by those who are not only able to understand the subtle system of processes between the organic and mineral material in the soil, but will also be able to supply a framework for the restructuring and rebuilding on all levels."**

molecules. Carbon's ability for double-bonding is not found in silicium as shown in the following comparison of the chemical formulas for ortho-carbonic acid and ortho-silic acid. By intramolecular splitting off of water, ortho-carbonic acid (a) becomes carbonic acid (b) and then dissociates into carbon dioxide. In the course of this process first one double bond is formed (b) and then two ensue (c).

As to ortho-silic acid we observe an intermolecular splitting off of water

only between two molecules which then form the compound ortho-disilic acid. Further condensation leads to structures that resemble chains, ribbons and petals. If the polymerization goes on even fur-

**"The colloidal system of the soil could be called a universal meeting point...For instance, organic and inorganic chemistry, which split up in different academic fields, meet perfectly as a structure-building, functional unity in the clay-humus complex."**

ther, the spacenetting structure of quartz ( $\text{SiO}_2$ ) is reached. While  $\text{CO}_2$  escapes from the porous system of the soil into the atmosphere, the highly polymer silicium molecules stay earthbound, mass-forming yet not inert. There are parts which are very well equipped for catalysis, especially when the finest of mineral particles or those with lattice-disturbances are at work. Hamaker and Weaver in TSOC (1982) aptly point out the importance of mechanical grinding by ice-age moraines for soil-life and the development of vegetation, as well as the effects of loess-drifts. Their claim we should imitate natural grinding and transportation by technical means to induce new life for the organic-mineral build-up of soil seems purely logical.

With quartz-blocks and salt-ions present in the soil solution, a substance able to feed a manifold community of organisms is bound to develop and the structural elements of the colloidal sphere can be formed. Colloids are higher ranking soil structures with a more luxurious energy-potential. Rock dust ground down, for example by glacier ice, will secure stability of the ecosystem soil wherever organic colloids join in. Organic colloids contain chemically bound sun energy. Their own stability is high and, to a certain extent, they are able to stabilize mineral colloids, especially in the porous aggregate which is the condition *sine qua non* of longevity and lasting fertility. If, on the other hand, acid emissions hit this subtle colloid system, the soil drifts into a dramatic situation of lost linkage between plant roots and colloidal particles.

As to organic colloids we should be aware that aromatic compounds are the most important. The "aromaticity" of

cellulose by lignin has already secured the stability of wood plants, which would not have been achieved easily in unligified cellulose. Without the encrustment of these durable phenolic substances, the first large scale colonization of terrestrial biotopes would have gone in another direction. Ecosystems which are not only exposed to rain, snow, hoarfrost and especially storms, but also display 75% of their biomass above ground, are in need of special physical properties to gain a secure footing and stability.

The second large colonization of further terrestrial biotopes by perennial grass species was also the result of aromaticity. This time it was the soil itself that was aromatized by humic acids and clay-humus complexes which can be very well observed in the chernozem. Perennial grass species deposit 75% of their biomass in a deeply penetrating root-system and produce the starting substance for the build-up of deep reaching black soil. High soil quality is the result of functioning links. These links must not be categorized as static structural elements. We should become conscious of their dynamics on the molecular level.

When weathering breaks stone structures in the soil, clay-minerals are formed which, in comparison with the

**"Hamaker and Weaver in *The Survival of Civilization* point out for good reasons the importance of mechanical grinding by ice age moraines as well as the effect of loess-drifts for soil life and the development of vegetation. Their claim, we should imitate natural grinding and transport by technical measures to encourage and induce the organic-minerals buildup of soil, seems pure logic"**

initial material, show a different structure: we find more irregularities, more crystal water and a higher capacity for absorbing  $\text{H}_2\text{O}$ . During formation of these colloids in some cases central cations with a different charge are built into the mineral structure. So Al changes place with  $\text{Si}^{4+}$ ; or  $\text{Mg}^{2+}$  substitutes  $\text{Al}^{3+}$ . The effect is a negative charge which is balanced by cations of positive



charge in the surface and intermediate layer areas of the colloids. In high quality soils these cations are  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$  and  $\text{K}^{+}$  which, by ion-exchange, are used by soil organisms or plant roots. In acid solid  $\text{H}^{-}$  and  $\text{Al}^{-}$  ions become factors of grave disturbances; they are no longer able to serve the formation of links, and soils disintegrate.

Wherever soils gain their inner consistency by sticky wrappings from bacteria and blue algae or by threadlike growing actinomyces and fungi, the dynamics of the colloidal structure of organisms are responsible. Vitality is the result of their functioning on a high level of energy. Wherever these links are missing, reduction of vitality follows immediately.

The earthworm has to be recognized as one of the most effective linking devices for soils. Massive flow of organic and mineral substances make its way through the intestines of the earthworm and are turned into clay humus

**"High soil quality is the result of functioning [network] links. These links should not be categorized as static structural elements and we should become aware of their dynamics on the molecular level."**

complexes. The deeply penetrating burrows of the earthworm allow for gas exchange with the atmosphere and roots reaching down into greater depths. The finest roots preferably penetrate soil particles which have gone through the earthworm passage.

While the building up of colloids is the basis for the linking system, root hairs in the interaction with capillary water are the basis for the exchange between soil colloids and plants. In high acidity, soil's capillary water vanishes with the breakdown of linkages.

The mycorrhiza fungi which supply water and mineral nutrients in symbiosis with the roots of forest trees are the links most endangered nowadays by acidity. The mycorrhiza has to rely on the supply of sugar by the tree. If this flow is cut off by deficiency and reduction processes, the mycorrhiza dies. This is what "Waldsterben" boils down to: a disintegration of links with the colloidal system and consequently the degradation of the colloidal system itself which could be called the heart of life on this globe.

When forests die, biotopes vanish; cultures degenerate and man faces the end of his endeavor. The ongoing  $\text{CO}_2$  drama is closely linked with dying forest ecosystems. While  $\text{CO}_2$  absorption by the oceans is possible in large quanti-

biotopes which absorbed sunrays and thus retained the warmth up to now, are suddenly permanently covered by snow and reflect the sun rays back into space. According to Kuhle, this is when an ice-age starts in this part of the world and

**"...colloids are higher ranking soil structures with a more luxurious energy potential. Ground down, for example by glacier ice, rock dust will insure stability of the ecosystem soil wherever organic colloids join in. Organic colloids contain chemically bound sun energy. They are extremely stable and to a certain extent, they are able to stabilize mineral colloids ... which are conducive for longevity and lasting fertility."**

ties, it is always a slow process. In comparison, forests show a much higher potential to absorb  $\text{CO}_2$  quickly, but, on the other hand, they give it back to the atmosphere suddenly when forest fires occur. The  $\text{CO}_2$  balance since the tertiary period has been upset by a slow cooling process, which, in the quaternary period, became part of a pattern: periodic climatic changes. There is ample evidence that  $\text{CO}_2$  plays a role as an indicator for the efficiency of vegetation cover and still plays its role in the development of cooling.

Hamaker and Weaver have offered important material for the understanding of the  $\text{CO}_2$  problem, especially by stressing the tectonic factor. In my understanding, there was still one missing link which has now been delivered by Matthias Kuhle's work "The Glaciation of Tibet and the Development of Glacial Periods". Kuhle states that in the tertiary period the Indian subcontinent started to slide down under the Eurasian land masses by heaving up the Highland of Tibet. In humid climates, when demineralization by leaching starts under natural conditions,  $\text{CO}_2$  rises. Rain, snowfall and albedo effects become more frequent in those parts of Tibet where it emerges from tropical zones with Monsoon rains. Cli-

only ends with the melting of ice covers which have been formed at a later date closer to the poles.

With  $\text{CO}_2$  rising dramatically, evidence points to a new ice age period approaching rapidly. It will need all our courage, knowledge and joint global ac-

**"This is what 'Waldsterben' boils down to: a disintegration of links with the colloidal system and consequently the degradation of the colloidal system itself which would be called the heart of life on this globe."**

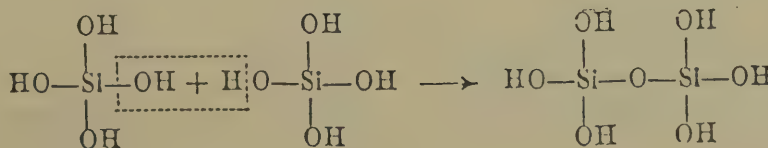
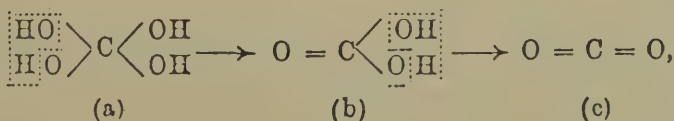
tivity, to slow down the impact. The starting point must be the buildup of the linkage system of soils. Man is still the missing link in the re-structuring of the biosphere he is in danger of destroying.

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# Towards a cold greenhouse

Some of the most recent research has been challenging the conventional view of a greenhouse warming.

**The New Scientist** reports,

"Researchers at the University of Hamburg and the Max Planck Institute for Meteorology suggest in **Nature** that all previous models of the carbon dioxide "greenhouse effect" are wrong. They say that when the world warms up, evaporation of water from the oceans produces so much extra cloud cover that incoming solar heat is reflected back into space, in a negative feedback."

"Simple calculations of computer models expect the world to warm by an average of 3-5 degrees C- these researchers say that much warming would produce enough clouds to cool the Earth by more than this."

This is hardly a new idea to readers of **The Survival of Civilization**. That's right. They say the greenhouse effect will lead to cooling!

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**...These researchers say that much warming would produce enough clouds to cool the Earth by more than this."**  
**The New Scientist**

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Other researchers have recently pointed out that variations in the optical properties of maritime clouds could dramatically alter the amount of heat absorbed by the ocean, and could have an important function in regulating the climate of the Earth. This could be another factor that could offset warming and contribute to cooling. The oceans in northern latitudes have been significantly cooling for the last 30 years according to scientist Patrick Michaels in an article in **The Washington Post**, *Greenhouse Effect: Then Why Is It Colder?*

James E. Hansen at the recent conference in Washington, **The First North American Conference on Climate Change: A Cooperative Approach**, stressed the role of clouds and ocean currents and general circulation patterns of the oceans as crucial factors along with volcanic emissions and changes in solar irradiance (currently declining) in finding out what is happening to the climate. These are factors not sufficiently modeled in computer models and projections so far. Hansen states in his paper,

"There is no clearly significant warming trend in either the model or observations for the period 1958-1985."

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**"There is no clearly significant warming trend in either the model or observations for the period 1958-1985."**

**James E. Hansen**

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The emissions of oceanic dimethylsulphide (DMS) are produced by phytoplankton. This along with atmospheric aerosol particles are seen "to contribute in cooling the surface of the earth."

The study asks, "Is it possible that marine plankton regulate the production of DMS as part of a global biological system to control the amount of sunlight reaching the Earth?"

The cover story of **Science News** on *The Plankton-Climate Connection*:

"Scientists widely believed...that the number of cloud particles determines the reflective properties of clouds. An increase in the number of condensation nuclei was thought to make marine stratus clouds reflect more sunlight. These types of clouds cover 30% of the world at any time... so an increase in their reflectivity would cut off much of the radiation that reaches the ocean surface, thereby lowering the water's surface temperature."

"According to the theory, if plankton produced more DMS, the surface of the earth would get cooler."

"In conjunction with previous knowledge about the climate, these new pieces of evidence are helping to convince scientists that plankton can influence global temperatures by

affecting the planet's general reflectivity. Says James Lovelock, 'I think the importance [of the new information] is considerable. It highlights a climate mechanism which is as large as or larger than the carbon dioxide-greenhouse [effect].'"

"..... A 30% increased change in the [nuclei] number cools the globe at the surface by 1.3 kelvins, which is a huge climate change. In comparison, during the last Ice Age, when ice sheets covered what is now New York City and much of the rest of the globe, the world was only 4 kelvins colder than it is today."

James A. Coakley of NCAR has shown with the help of satellite photos that exhaust from ships leave long highly reflective trails in marine clouds. Particles over the ocean thus could raise the reflectivity of clouds.

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**"I think the importance [of the new information] is considerable. It highlights a climate mechanism which is as large as or larger than the carbon dioxide-greenhouse [effect]."**

**James Lovelock**

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Another intriguing and significant article in **Natural History** which has caught the attention of scientists is *The Biggest Chill- When ocean currents shifted, Europe suddenly got cold. Could it happen again?* by Wallace S. Broecker.

He says, "inquiries have recently revealed a piece of disquieting information. Geological studies suggest the earth's climate system resists change until pushed beyond some threshold: then it leaps into a new mode of operation." Past climate has changed in sudden leaps, rather than gradually.

In the early 1980's Oeschger and his group at the University in Bern, Switzerland carried out detailed measurements of the CO<sub>2</sub> content of air trapped in the ice from a deep boring made in southern Greenland. The findings emphasize there have been extraordinary and sudden changes in CO<sub>2</sub> concentrations in the atmosphere, that this requires "some extraordinary change in the earth's chemical cycles, particularly those operating in the ocean. Scientists were therefore forced



involving the working of the ocean as well as those of the atmosphere." He says this "brings to the fore the potential importance of a curious tie that exists between the function of today's ocean and today's atmosphere."

Scientists studying pollen grains preserved in sediments have also revealed sudden leaps from warm to glacial conditions and vice versa, such as the Younger Dryas, when Europe plunged into the glacial conditions while the U.S. maintained a warm climate.

"Because of their basic design, these computer models cannot tell us anything about the ocean-atmosphere system and leaping climates. At present no one knows how to incorporate the oceans and these simulations...I doubt if computer simulations will offer much insight into the changes in climate that might be triggered by the greenhouse buildup." He advises that the upshot is..."We must expand our efforts to understand the operation of each of the units of the earth's climate system and how they interact."

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**I doubt if computer simulations will offer much insight into the changes in climate that might be triggered by the greenhouse buildup."**

**Wallace S. Broecker**

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Two significant papers have been written recently by Fred B. Wood, Jr. a Senior Associate of the Office of Technology Assessment of Congress. One has been accepted for publication in the journal *Climatic Change* and the other has been submitted to the journal *Arctic and Alpine Research*.

The first paper, *On The Need for Validation of the Jones et al. Temperature Trends With Respect To Urban Warming*, suggests that uncorrected urban warming could account for some of the hemispheric and global warming reported by Jones and Wigley. He points out many present weaknesses in gathering data, especially not separating out clearly weather stations influenced by an urban heat island effect, which bias the global mean

He makes several suggestions for correcting this and arriving at a more accurate assessment of true global mean temperatures.

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**"Between 1960 and 1980, based on data for about 400-450 glaciers observed each year, advancing glaciers increased from about 7 percent of observed glaciers to 55 percent."**

**Fred B. Wood, Jr.**

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*Global Alpine Glacier Trends 1960's-1980's*, mentions that "Between 1960 and 1980, based on data for about 400-450 glaciers observed each year, advancing glaciers increased from about 7 percent of observed glaciers to 55 percent. He suggests that observed glaciers are probably less than one percent of the total number of glaciers worldwide. In order to assess the climatic implications of the shift, priority should be placed on expanded use of satellite images to augment ground surveys and increasing glacier monitoring in geographic areas now seriously under-represented such as Canada, China, the Himalayas, the Andes and the U.S., especially Alaska; and increasing the monitoring of temperature and precipitation at glacier sites in order to facilitate research on the relationships between climatic and glacial change."

Is it curious, as Broecker says, that the earth is a biosphere, that the oceans and atmosphere, land masses, tectonic and volcanic activity, the dynamics of glaciers, forests and soils, make up a general system, a living organism? Hopefully scientists are waking up to a larger view that acknowledges the complexity of the earth as a living system of extraordinarily subtle interactions and feedback mechanisms.

A conclusion that can be drawn from much of the latest research is that Hamaker's work is without question worth serious inquiry. While there are some who feel he proves we are entering an Ice Age, I have always felt it is important to maintain a slightly less conclusive stance. And yet all the CO2 conferences in Washington and around the world and current research have not convinced me so far that Hamaker is on the wrong track. I do not wish to over identify with Hamaker to the degree I

temperature in the direction of warming. would not be thankful if I could shown the error of his thinking and that we could not possibly be

entering the next Ice Age. Until this happens I will plug away at getting his message out to be properly scrutinized by the public, policy makers and scientists as it deserves.

Contrary to the impression of absolute consensus given by the press, there are scientists who are convinced the climate is not warming, some who think there is an overall cooling and others who are convinced we are in the transition from the interglacial to a glacial period.

Some agree with John Hamaker, and some do not necessarily agree with him but are convinced that there are other factors pointing to a similar conclusion. Some of these scientists are Ken Watt eminent scientist Viktor Kovda of the U.S.S.R., geologist and quaternary scientist C. Bertrand Schulz, Hugh W. Ellsaesser, Reid Bryson, Irving Kaplan, Alexis Dreimanis, Sir Hubert Lamb, George Kukla, astronomer Sir Fred Hoyle, and James Lovelock.

Joanna Campe

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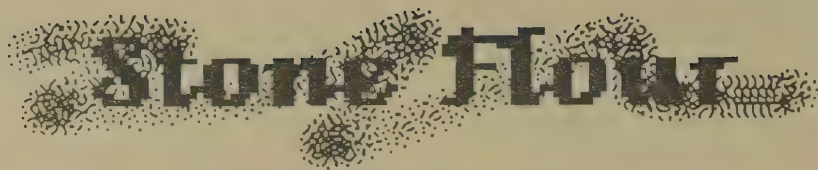
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## Information on Powdered Gravel For Sale, and the opportunities for becoming an Authorized Producer, Winter 1987

We recently had a major breakthrough in the grinder design. We have achieved a much higher pressure than before, which greatly increases the output, and makes the grinders more compact.

We are now offering **STONE FLOUR**, ground from our excellent river gravel deposits, which have over 150 different "types" of silicate rocks; a very good variety. For economy, we package the dust in 70 pound bags (approximate gross weight). The price per bag depends on the quantity ordered:

1-9 bags,...\$6 each  
10-29 bags,\$4 each  
30 or more,...\$3 each

For orders of five bags or less, UPS is the best method of shipment. To find the cost, take the first three digits of your ZIP Code, and consult the chart below. The shipping charge for each bag appears at the right. Include the total shipping charge with your order.

### Zip Code prefix

010-219.....\$17	shipping per bag
220-376.....\$13	
377-582.....\$11	
583-608.... \$17	
609-703 ... \$11	
704-797.... \$9	
798-893.... \$17	
894-994.....\$21	
995-999.... \$25	

If you live very far from Arkansas, inquire about Authorized Producer/Dealers that might be closer to you. You might save on shipping costs.

For orders of six bags or more, shipping by motor freight is usually less costly. The freight charge for *one ton* would be about \$170 to \$250, depending on your location. Thus, the *total* cost of a ton (30bags) would be about \$260 to \$340, delivered. To order a shipment by motor freight, simply send us the proper amount for the dust (\$90 for 30 bags, for instance), and then pay the freight charge to the driver upon delivery.

If you would like to come get a pick-up truck load, or a trailer load, in *bulk* (not in bags)....Or if you want a "dump truck load" shipped... the charge is as follows:

1/2 Ton..... \$15 a load  
1-2 tons..... \$25 per Ton  
3-9 Tons.....\$18 per Ton  
10 or more..\$14 per Ton

### A Design Breakthrough

We had an unexpected breakthrough with the grinder design. I discovered that my very first tests two years ago had given me a false reading on the pressure required to get the rocks and particles in the chamber to BUST (instead of just "rubbing together").

All this time, I've been using a fairly high pressure (500 psi), but not nearly high enough. Once I realized this fact (just recently), it took a lot of experimenting to find out what the required pressure really was, and then to get the grinder to develop that much pressure. Not as easy as it sounds....

I ended up building two prototype grinders, and did many modifications on them. Recently, I finally got it to work. I did some tests of the output at this high pressure and was pleased to discover that the grinders now pump

out three times as much dust as before. A two or three horsepower grinder, which is what I'm now building, will produce up to 2,500 pounds per hour! And that grinder is no bigger than a washing machine!

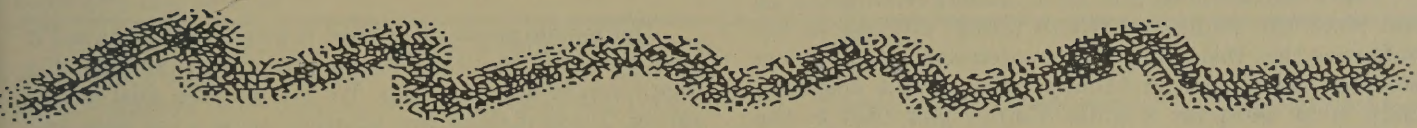
The almost mind boggling efficiency of my high pressure grinder, with corrected air flow, is mainly due to John's [John Hamaker] original principle, which is to *shear* the rock particles into smaller and smaller pieces, rather than crush them, which takes at least four or five times as much power. Also, rubbing the rocks together to generate dust is very inefficient.

### Stone Flour versus Miracle-Gro

I recently did some "pot tests" with sweet corn. I used eleven inch pots, filled with soil from our "upper garden" which consists of a heavy soil, with a modest amount of organic matter, having had very little compost added during the last few years. I used three pots. In the first, I left the soil plain. In the second, I mixed in a pound of **STONE FLOUR**.. The third pot had no gravel dust, but got a weekly recommended dose of MIRACLE-GRO a national brand chemical "fertilizer" with water soluble copper, iron, manganese, and zinc.

The Miracle-Gro probably had an advantage since it was the first time in 20 years that that soil had had any chemical fertilizer on it. I believe it was in an early Bulletin that the acids in chemical fertilizers cause some surface etching and mineral release, making the first crops pretty good, but subsequent crops fail to match the first.





Anyway, the **STONE FLOUR** had the disadvantage of not having a chance to "activate" first. In spite of the possible handicap, the **STONE FLOUR** grown plants (I thinned down to three per pot) were about 20% to 50% larger than the Miracle-Gro plants, and they were 100% to 200% larger than the "untreated" plants (control).

I did some calculating, and found that it would take about \$6 worth of Miracle-Gro to "properly" treat 100 square feet for a three month season.

Whereas, if a sack of **STONE FLOUR** were purchased at a garden supply store for \$10, the annual cost would be a mere \$2.50. That is calculating 70 pounds of dust applied to 100 sq. feet which should last at least four years, dividing \$10 by four.

So that's \$6 per year versus \$2.50 per year. Not bad considering the superiority of the gravel dust results. The \$10 price per bag can be obtained now by ordering 30 bags or more from me. A single bag, shipped from Arkansas, would cost a total of \$15.00/\$20.00 ppd. Even at \$20 a bag, the **STONE FLOUR** is still cheaper per year than Miracle-Gro!

## The Mobile Grinder

The main reasoning behind the Mobile Grinder is the convenience of it. The foundation\* does not own any gravel pits yet, nor do we have a fleet of dump trucks, so we should take advantage of the present gravel pit system, and have them deliver the gravel to the site.

It is easier to haul gravel than dust,

which must be covered while in transit. Since the new "high pressure" grinders are so compact, it is no big burden to transport the grinder to the site.

My latest idea for the Mobile Grinder is to mount it on the front of a 16' trailer, including the "loading arm", and have a separate "spreader vehicle" which would be transported on the rear half of the trailer, when going from one site to another.

So, to use the *Mobile Grinder Outfit*, the gravel is delivered ahead of time by the local pit. Then the "outfit" is towed to the first pile of gravel. Using the controls, the operator manipulates the "loading arm" to load up 500 pounds of gravel at a time, until the "feed hopper" is full. The turbine would then be started, and grinding begun. When the "collection hopper" is full of dust, the "spreader vehicle" is driven up along side the trailer, and a three ton load of dust is taken on. The spreader vehicle is then driven out into the field to spread the moist dust.

Meanwhile, the trailer mounted grinder is grinding the next batch, moistening the dust, and storing it in the "collection hopper". The output would be about twelve tons per hour, or more. That would require a 25 horsepower steam turbine. The spreader vehicle would be powered by compressed air; recharged every time it comes back for a load of dust.

It would be better if we had large, stationary grinders set up at our own gravel pits all over the word, but that is a ways off. These *Grinder Spreader Outfits* make it practical to do large jobs with a minimum of expense or investment. Lime spreading trucks

could be hired, but they charge a lot, and it's not good to have to rely on them to show up on time, etc. For those who get one of my smaller, stationary grinders, the lime trucks may have to be used occasionally, anyway.

## Franchise Grinders

As for the *franchise grinders*, I'm probably going to eliminate the *medium sized unit* and increase the size of the small one, so that it produces about two tons per hour, instead of one. Everyone either orders the biggest one or the smallest, so I doubt that there is any need to offer the medium sized one. We will begin manufacturing the small grinders next week. We have orders for four of them, plus I'll build one for myself.

The deposit requirement for the smaller grinder will remain at \$1200, even though I'm going to make them with twice the output as I previously specified. Also, as an at least temporary power supply for both the large and small grinders, I'm working on developing a super simple wood burning *gas turbine*! It will have only one moving part, and will burn a mere 12 pounds of wood to produce ten horsepower for an hour! If it works as well as I think it will, it will be a handy (non-petroleum) power source to use until we get the more costly, but superior, solar power unit developed. I may put a small, supplemental solar collector on these first grinders, even if they are mainly powered by the wood burning turbine. j

Also we are about to publish our introductory booklet and brochures.

Send orders or inquiries to:  
Mark Williams  
Route One  
Horatio, AR 71842

\*SR #6 summer issue describes the foundation and franchise operation



There has been a bit of a lull in matters relating to rock dust since the conference. Keith (Gray) told me at the conference that there was to be a protracted maintenance period on the crusher, and that supplies of rock dust were likely to be short for a while. Keith's plot trial at the conference venue was a little disappointing. I think he'd hoped it would be more graphic and startling. The constraints of the site worked against it a bit, I'm afraid.

When available, I continue to feed rock dust as a supplementary ration to my free-range poultry, and hope that it all passes through onto the orchard floor, where it can have beneficial effects on the apple trees. When I mix it up with the yeast and seaweed powder that goes into the mash ration, I'm grateful that the hens don't lay concrete shelled eggs. The rock dust looks just like cement powder!

To bring you u-to-date on some of the conference details, the latest issue of *Soil and Health* is wrapped around this letter. Regards to everyone at TERRA and the SR network in your area.

**Perry Spiller**

The Soil and Health Assn.  
Hawke's Bay, New Zealand

I was very interested in the article about rock dust in the summer 1986 issue of *Soil and Health*. We have a farm along the north bank of the Rakaia River some 13 kilometers below the Rakaia Gorge bridges. It is terrace country formed by glaciers and littered with greywacke boulders form large to small and hence the name of our farm, "Boulder Park". It is classed as new soil and is great stock country provided one also applies copper, cobalt, sulphur and selenium, the first two about every four years.

Fertility was low but with lime and topdressing has built up to moderate levels. This season we have switched over to North Carolina rock phosphate and added sulphur with the hope that we can get away from the savage surge of growth and imbalance provided by superphosphate.

Two interesting stories I have heard of farmers- one in the Russell's Flat area and another at Mayfield- who each decided to pick up every stone off a paddock. Both found they soon grew very little. They had to put some stones back. It seems greywacke contains potassium which is slowly leached into the soil. Recently we learned it also contains phosphorus, but andesite and basalt have more. .

Our garden which is around 25 years old would not hold its soil structure more than three years. It would then go to powder and badly crust after a rain. After twice resting it for about two years, a time in grass and clover, and , after the last rest, adding a lot of unused mortar and some golden silica sand from Wairiri Valley, plus continuing compost and directly applied vegetable waste and animal manure, it seems to be holding its structure. The sand probably has much to do with this as early on we used lot of animal manure.

**Tom and Helen Abbott**

Darfield, Canterbury, New Zealand.

*editor: This was published in the Winter 1987 issue of Soil and Health magazine.*

Our tomato plants go to 6 feet in height and we have 2 ft long zucchini squash. Our melons are great also. Big improvement over last year. We just put the dust in this spring. Thought there was supposed to be a lag time, but sure took off this year. We got our dust from a quarry just north of Connellsville, PA- my relatives are from there- went and got it in a truck.

We used 3lbs of dust per sq. ft. of garden area as per John's book. We got the left-over "bug dust" that is the by-product of the gravel- it was a very fine powder. We were charged \$5.00/ton. We thought this stuff wasn't supposed to work until a year or so after first application!

**Diane and David Butler**  
Stevensville, Maryland

I found the idea of Deralde Carwile on mixing yogurt, milk and edible rock dust intriguing and have begun to experiment, except I use kefir grains instead of yogurt culture to inoculate my milk.

Wrote to Mark Williams for info on his hand grinder. Have you seen or used one? Or know anybody who has one? We have access to glacial moraine sand which I want to pulverize for my garden and some of our trees. Next year I would remineralize 1/2 of my garden and look for differences. Then I could be in a position to introduce friends to the practice. And take pictures and publicize it.

The Namaste Greens have my admiration.

**Helene Huber**  
Salfordville, Pennsylvania

I am enclosing information from *Science News*. . Maybe you have connections with some university that has both an environmental department and a cat scan. Discovering how the roots of tiny trees and/or plants use rock dust would be a great graduate thesis.

Some excerpts from *Science News*: "Researchers at the Georgia Experiment Station in Griffin are using a novel technique for performing agricultural research. They are experimenting with the use of computer-assisted tomography, or CAT scan, to look at everything from root-mass growth to apple bruises. Their work represents the first time a CAT Scanner- designed to perform detailed X-Ray analysis of the human body- has been completely dedicated to agricultural research...early success in imaging such things as root systems, plant pest distributions and water absorption patterns using large potted plants inspired the Experiment Station, which is operated by the University of Georgia, to acquire its own machine. 'The Scanner allows us for the first time to look at the same plant, the same soil system, day after day after day, without having to dig into the real system'..." Contact Dr. E.W. Tollner, Georgia Experimental Station, University of Georgia, Griffin, GA 30223. (404) 228-7216. The Cat-Scan being used in Georgia is EMI-CT-5005.



## Letters continued

This use of a CAT Scan provides us accurate information never before available. Consider our urgent need to replenish agricultural soil that continues to be badly damaged, conduct massive reforestation and save dying forests! If remineralization could be the fastest cheapest answer to these world wide problems, shouldn't we ask many institutions to investigate how remineralization works?

Would it be possible to find a scientist or a graduate student, who would undertake similar research relative to the interaction of seeds and roots with soil that has been enriched with rock dust, glacial gravel and/or volcanic ash?

This research is badly needed to refute the claims of those who would have us believe that the example of vigorous healthy rapid growth obtained with the use of such easily available and inexpensive materials are just freakish accidents.

Virginia B. Goldstein  
Oakland, CA

...Weather records at the museum are continuous since 1894, so it was impressive that 1985 and 1986 recorded no 90 degree temperatures (the only other "back-to-back" years 1896-97). And the summer of 1986 was the coldest since 1902, making it the third coldest on our records. June featured a freeze on the 2nd, killing the apple blossoms, and another frost on the 25th, ending any aspirations I had for tomatoes! To top things off, a frost on August 18 ended my dismal 54 day growing season.

This summer has been warmer, but July managed to tie a record high on the 12th, then set a record low on the 29th, at St. Johnsbury, Vermont. The 29th saw spotty frost in outlying areas!

Snowfall has been increasing over the past twenty years, raising the average winter total from 79 inches to 88 inches. This current decade has been extremely variable in snowfall, though the past four winters have exceeded the average, and should this upcoming winter pile it on, five years in a row—something that has never occurred on our records.

Mark Breen  
Concord, Vermont

*Editor: This letter from meteorologist Mark Breen was sent to Don Weaver.*

Audio Cassette tapes are available of *Eden or Ice Age- Which Will We Choose, The Regeneration of Our Soils and Forests* by Joanna Campe, presented at the American Society of Dowsters Convention, September, 1987. Send \$7.00 which includes postage to the **SR** newsletter, 152 South Street, Northampton, MA 01060.

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## **SOIL REMINERALIZATION A NETWORK NEWSLETTER**

Joanna Campe  
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